



Tomorrow's manufacturing solutions, today

# WORK SMARTER

*Smart machine shops meet the challenge of delivering better results by investing in quality machine tools*

**H**igh pressure coolant in machining operations, defined as pressures over 200 psi, has been around for over 100 years. It has been our ability to make drills that have coolant holes through the center of the drill, allowing the chip to evacuate up the flutes, which has allowed machine tool users to see the greatest results in high pressure applications. In drilling, the intention is to pump enough coolant through the tool to completely fill and pressurize the hole. The point of this is to eliminate any possibility of vapor forming so you never get the high temperatures normally associated with metal cutting. Therefore, the cutting speeds, feeds, surface finish, tolerances, and tool life increase dramatically.

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## Which Solutions Matter Most?

ChipBlaster is the pioneer in high pressure machine tool applications. Hartwig Inc. recommended a 1200 psi unit that would adapt quickly and easily to the Okuma MA400. Die Solutions' owner, Randy Meyer stated, "the ChipBlaster system works great, Hartwig Inc. did a great job jumping on this and finding the right solution. They even provided the details to allow us to install it ourselves. This saved us from losing the job."

Remember two rules of thumb in high pressure coolant applications: use 10 gallons/minute of inch diameter of tool, and use .5 gallons/minute of horsepower of the machine tool.

## In Depth Research

Die Solutions in Washington, Missouri, had purchased an Okuma MA400 horizontal machining center from Hartwig Inc. in 2007. This machine had been equipped with a 200 psi through the spindle coolant system. This standard coolant system is good for many machining applications. However, the requirements for the type of work pieces that are processed on the MA400 needed a higher pressure system. Die Solutions contacted Hartwig Inc. to evaluate the application.

## The Breakthrough

The application was to drill a .422 diameter hole, in 4340 steel, at a depth of 8.75". The tolerances on the hole are .002 on the diameter and .005 on concentricity. These tolerances are very difficult to attain at this depth. The choice of the drill bit also required research and a desired specification.

